

Monthly Marine Biotoxin Report

May 2009

Technical Report No. 09-20

INTRODUCTION:

This report provides a summary of biotoxin activity for the month of May, 2009. Ranges of toxin concentrations are provided for the paralytic shellfish poisoning (PSP) toxins and for domoic acid (DA). Estimates are also provided for the distribution and relative abundance of *Alexandrium*, the dinoflagellate that produces PSP toxins, and *Pseudo-nitzschia*, the diatom that produces domoic acid. Summary information is also provided for any quarantine or health advisory that was in effect during the reporting period.

Please note the following conventions for the phytoplankton and shellfish biotoxin distribution maps: (i) All estimates for phytoplankton relative abundance are qualitative, based on sampling effort and percent composition; (ii) All toxin data are for mussel samples, unless otherwise noted; (iii) All samples are assayed for PSP toxins; DA analyses are performed as needed (i.e., on the basis of detected blooms of the diatoms that produce DA); (iv) Please refer to the appropriate figure key for an explanation of the symbols used on the maps.

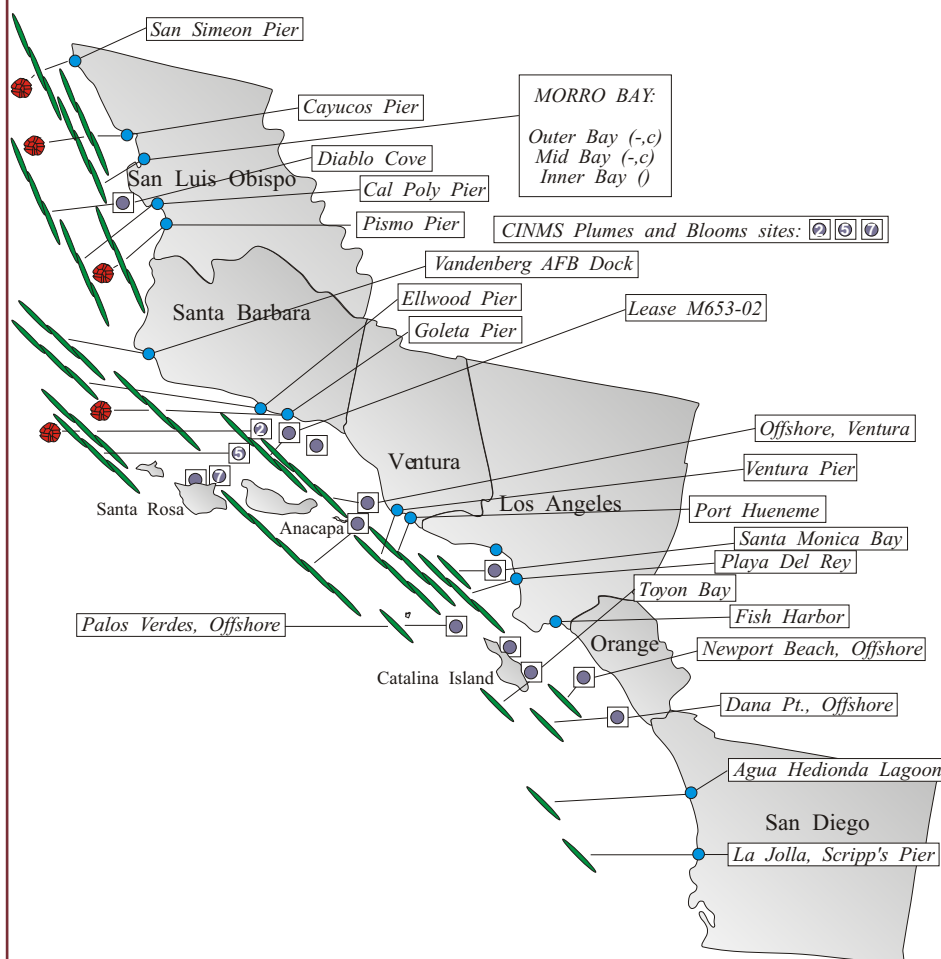
Southern California Summary:

Paralytic Shellfish Poisoning

Alexandrium was observed in very low numbers at sites between San Luis Obispo and Santa Barbara counties during May (Figure 1). PSP toxins were not detected in any shellfish samples.

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Figure 1. Distribution of toxin-producing phytoplankton in Southern California during May, 2009.



Relative Abundance of Known Toxin Producers

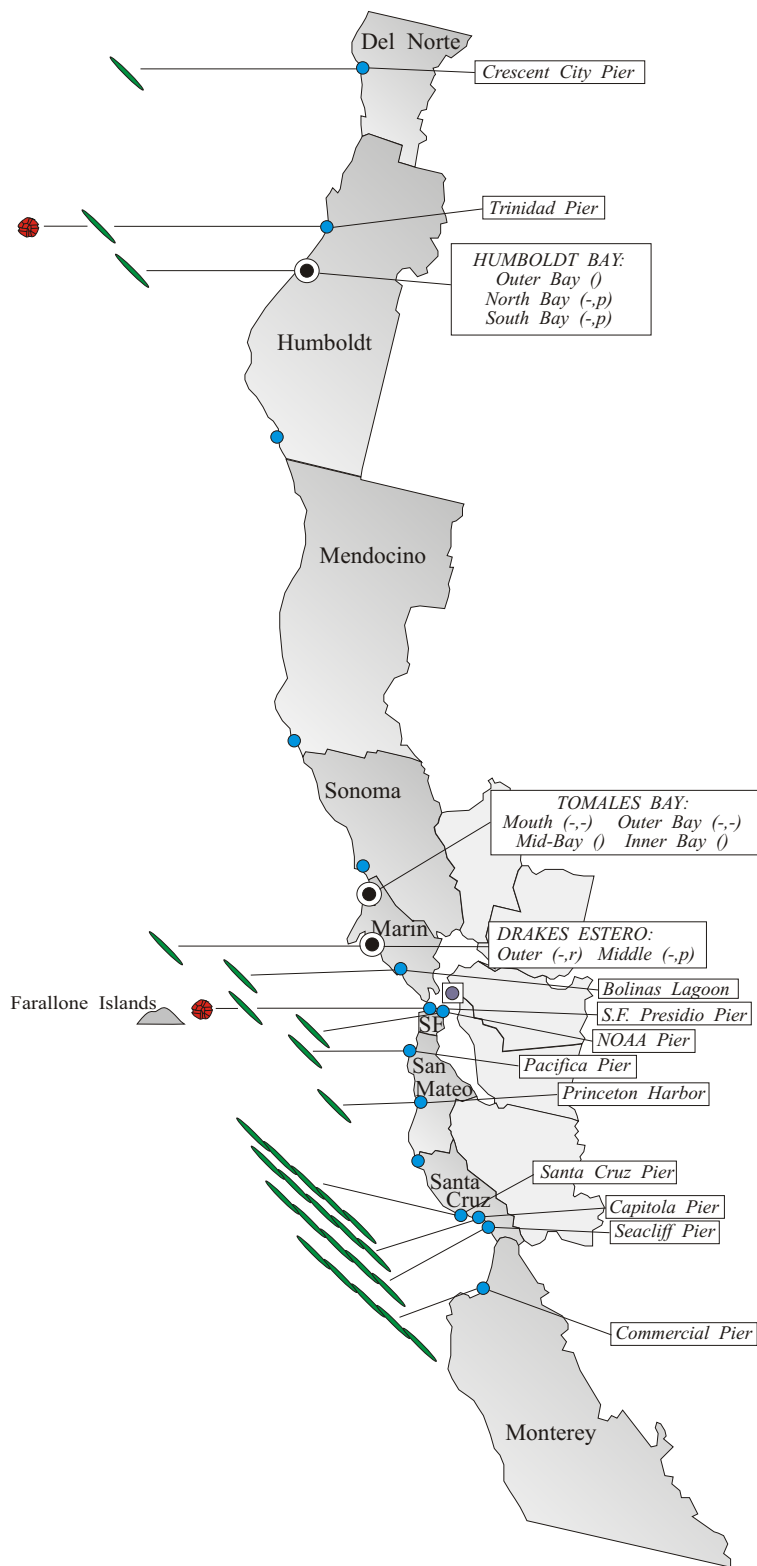
Alexandrium Species		Pseudo-nitzschia Species	
	Rare (less than 1%)		Present (less than 10%)
	Present (between 1% and 10%)		Common (between 10% and 50%)
	Common (between 10% and 50%)		Abundant (greater than 50%)
	Abundant (greater than 50%)		

MONTHLY SAMPLING STATIONS:

- Single Sampling Station
- Multiple Sampling Stations
- Offshore Sampling Station

For areas with multiple sampling stations, species abundance at each station is represented as follows:
(a,p) = Abundance for *Alexandrium* and *Pseudo-nitzschia*.
e.g., (c,p) = common, present; (a,-) = abundant, not observed

Figure 2. Distribution of toxin-producing phytoplankton in Northern California during May, 2009.



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Domoic Acid

Pseudo-nitzschia was detected along the entire southern California coast during May (Figure 1). The density of this diatom was reduced at sites between Santa Barbara and San Diego counties, although *Pseudo-nitzschia* remained common between Santa Barbara and Los Angeles. The greatest relative abundance of this diatom was observed in a sample from the Cal Poly Pier on May 4.

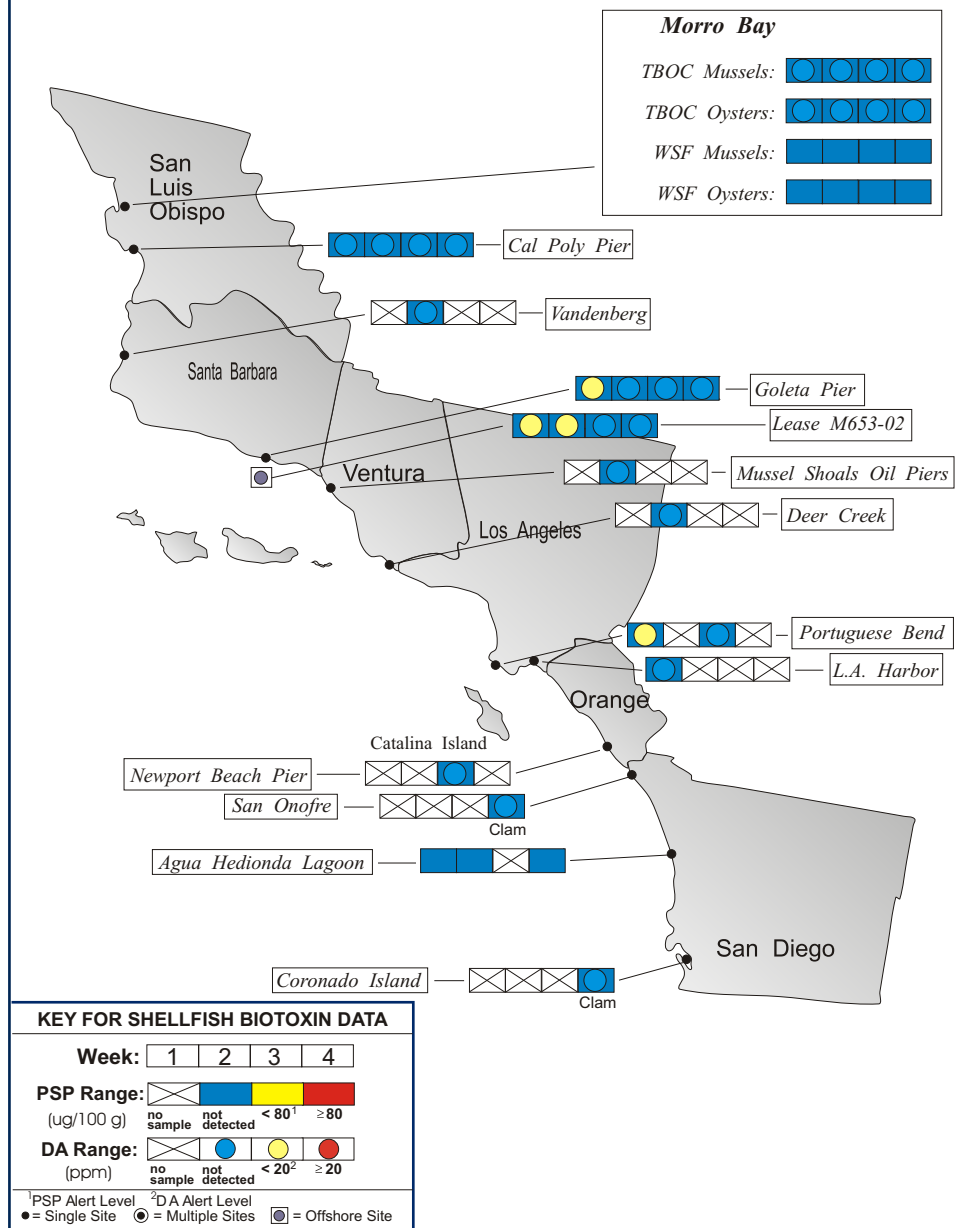
Domoic acid was detected in shellfish samples from sites in Santa Barbara and Los Angeles counties (Figure 3). Toxin levels declined at Santa Barbara sites compared to results from the end of April, reaching a maximum of 11 ppm in mussels from an offshore aquaculture lease on May 5. Domoic acid remained at low levels through May 19, when it declined and remained below the detection limit. A mussel sample from Portuguese Bend (Los Angeles County) contained 3 ppm of domoic acid on May 5, declining below the detection limit by May 19.

Non-toxic Species

Diatoms continued to dominate the southern California coast. *Chaetoceros* and *Bacteriastrum* were the most abundant species observed. The highest relative abundances were observed at the Cal Poly

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Figure 3. Distribution of shellfish biotoxins in Southern California during May, 2009.



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Pier (San Luis Obispo County).

Northern California Summary:

Paralytic Shellfish Poisoning

Alexandrium was observed at two sampling sites in May (Figure 2). Very low numbers of this dinoflagellate were observed in samples from the Presidio Pier (San Francisco County) on May 5 and Trinidad Pier (Humboldt County) on May 12. PSP toxins were not detected in any shellfish samples during the month.

Domoic Acid

Pseudo-nitzschia was observed at several sites in May (Figure 2). There was a significant increase in *Pseudo-nitzschia* at sites in Monterey Bay through the middle of the month, declining but remaining common at the end of May. The highest relative abundance was observed at the Santa Cruz Pier.

Domoic acid was detected at two sites in Monterey Bay. Low levels of domoic acid were detected in several mussel samples from the Santa Cruz Pier through May 22. The highest concentration detected was 9 ppm on May 13. A mussel sample from the Monterey Commercial Wharf, collected on May 14, contained 4 ppm of domoic acid.

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The Marine Biotoxin Monitoring and Control Program, managed by the California Department of Public Health, is a state-wide effort involving a consortium of volunteer participants. The shellfish sampling and analysis element of this program is intended to provide an early warning of shellfish toxicity by routinely assessing coastal resources for the presence of paralytic shellfish poisoning (PSP) toxins and domoic acid.

The Phytoplankton Monitoring Program is a state-wide effort designed to detect toxin producing species of phytoplankton in ocean water before they impact the public. The phytoplankton monitoring and observation effort can provide an advanced warning of a potential toxic bloom, allowing us to focus sampling efforts in the affected area before California's valuable shellfish resources or the public health is threatened.

For More Information Please Call:
(510) 412-4635

For Recorded Biotoxin Information Call:
(800) 553-4133

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Non-toxic Species

Diatoms continued to dominate the phytoplankton assemblage along the northern California coast. *Chaetoceros* remained the most abundant genera observed. *Thalassiosira* and *Skeletonema* were also common at several sites during the month. The highest relative abundances were observed in Tomales Bay at Lawson’s Landing (*Chaetoceros*, May 20) and in Bodega Harbor (*Chaetoceros*, *Asterionella*, May 17).



QUARANTINES:

The annual mussel quarantine went in effect on May 1. This quarantine applies specifically to the sport-harvesting of mussels along the entire California coastline, including all bays and estuaries. Routine phytoplankton and biotoxin monitoring is maintained throughout the year, not just within the quarantine period. This allows the detection of unexpected increases in biotoxin activity outside of the routine quarantine period. The annual quarantine does not apply to the certified commercial shellfish growing areas in California, which are monitored intensively. All certified shellfish growers are required to submit at least weekly samples of shellfish for toxin monitoring. Harvest

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Figure 4. Distribution of shellfish biotoxins in Northern California during May, 2009.

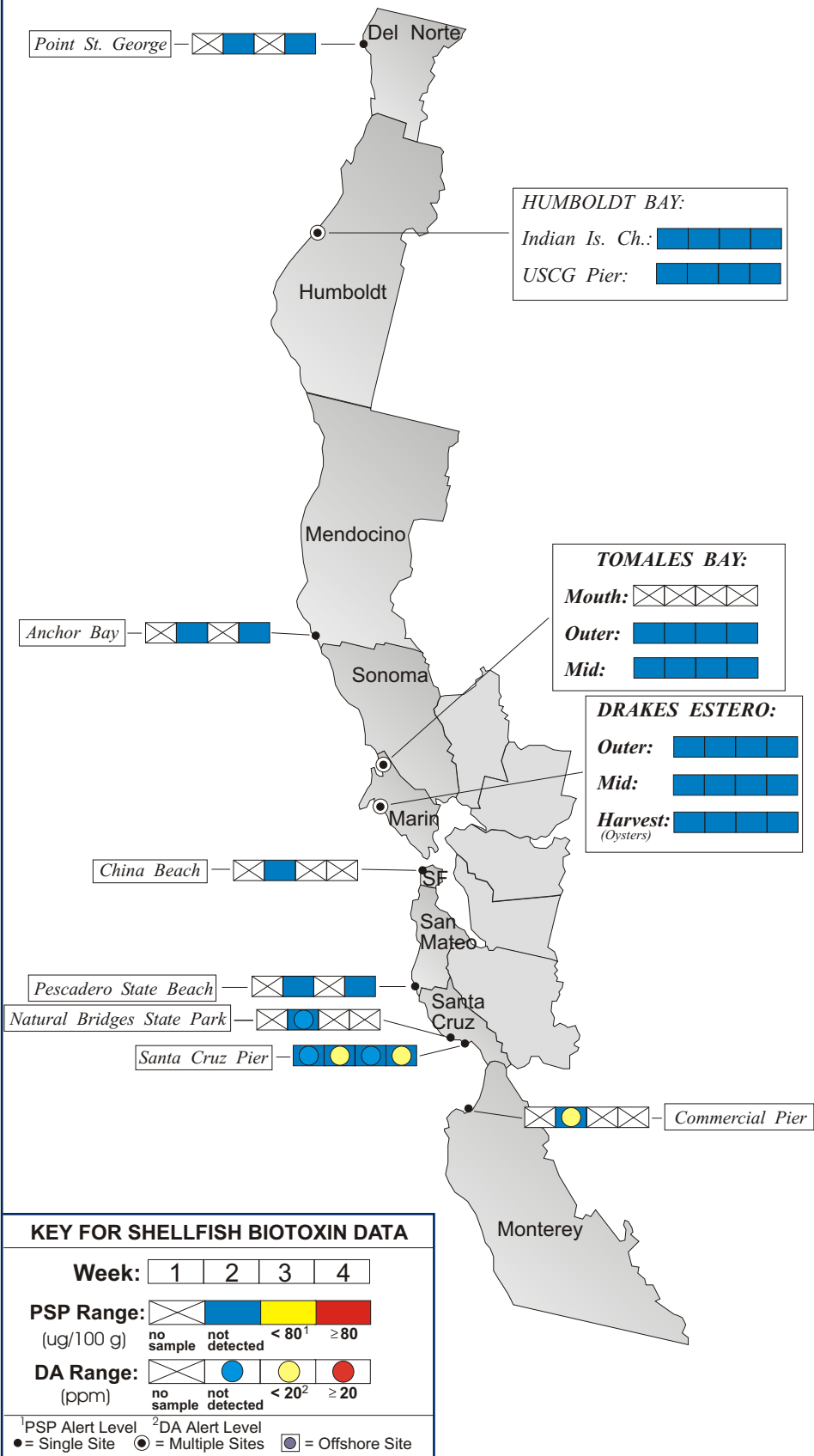


Table 1. California Marine Biotoxin Monitoring Program participants submitting shellfish samples during May, 2009.

COUNTY	AGENCY	# SAMPLES
Del Norte	Del Norte County Health Department	2
Humboldt	Coast Seafood Company	9
	Humboldt County Environmental Health Department	1
Mendocino	CDPH Volunteer (Marie De Santis)	2
Sonoma	None Submitted	
Marin	Cove Mussel Company	4
	Drakes Bay Oyster Company	16
	Hog Island Oyster Company	5
	Marin Oyster Company	2
San Francisco	San Francisco County Health Department	1
San Mateo	San Mateo County Environmental Health Department	2
Santa Cruz	Santa Cruz County Environmental Health Department	1
	U.C. Santa Cruz	5
Monterey	Monterey Abalone Company	5
San Luis Obispo	Cal Poly	4
	Tomaes Bay Oyster Company	8
	Williams Shellfish Farms	8
Santa Barbara	Santa Barbara Mariculture Company	12
	U.C. Santa Barbara	4
	Vandenberg AFB	1
Ventura	Ventura County Environmental Health Department	2
Los Angeles	Los Angeles County Health Department	3
Orange	Orange County Health Care Agency	1
San Diego	Carlsbad Aquafarms, Inc.	4
	CDPH Volunteer (Steve Crooke)	3

restrictions or closures are implemented as needed to protect the public's health.

Consumers of Washington clams, also known as butter clams (*Saxidomus nuttalli*), are cautioned to eat only the white meat. Washington clams can concentrate the PSP toxins in the viscera

and in the dark parts of the siphon and can remain toxic for a long period of time. Persons taking scallops or clams, with the exception of razor clams, are advised to remove and discard the dark parts (i.e., the digestive organs or viscera). Razor clams (*Siliqua patula*) are an exception to

this general guidance due to their ability to concentrate and retain domoic acid in the edible white meat as well as in the viscera.

PSP toxins affect the human central nervous system, producing a tingling around the mouth and fingertips within a few minutes to a few hours after eating toxic shellfish. These symptoms typically are followed by disturbed balance, lack of muscular coordination, slurred speech and difficulty swallowing. In severe poisonings, complete muscular paralysis and death from asphyxiation can occur.

Symptoms of domoic acid poisoning can occur within 30 minutes to 24 hours after eating toxic seafood. In mild cases, symptoms of exposure to this nerve toxin may include vomiting, diarrhea, abdominal cramps, headache and dizziness. These symptoms disappear completely within several days. In severe cases, the victim may experience excessive bronchial secretions, difficulty breathing, confusion, disorientation, cardiovascular instability, seizures, permanent loss of short-term memory, coma and death.

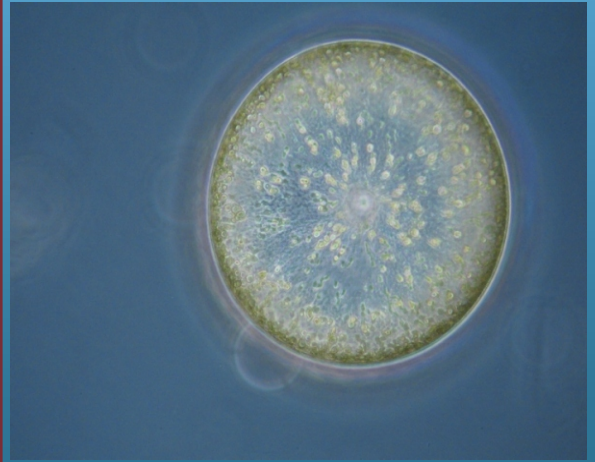
Any person experiencing any of these symptoms should seek immediate medical care. Consumers are also advised that neither cooking or freezing eliminates domoic acid or the PSP toxins from the shellfish tissue. These toxins may also accumulate in the viscera of other seafood species such as crab, lobster, and small finfish like sardines and anchovies, therefore these tissues should not be consumed. Sport harvesters are encouraged to contact the "Biotoxin Information Line" at 1-800-553-4133 for a current update on marine biotoxin activity prior to gathering and consuming shellfish.



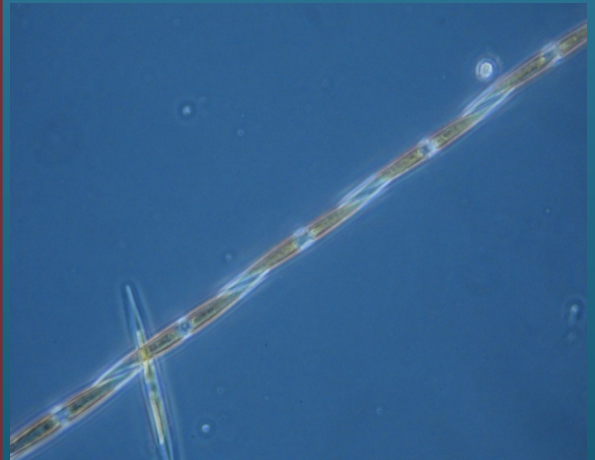
Table 2. Agencies, organizations and volunteers participating in marine phytoplankton sample collection during May, 2009.

COUNTY	AGENCY	# SAMPLES
Del Norte	Del Norte County Health Department	4
Humboldt	Coast Seafood Company	4
	Bureau of Land Management	1
	Humboldt State University	2
	Fortuna High School	2
Mendocino	CDPH Volunteer (Marie De Santis)	3
Sonoma	CDPH Volunteer (Cathleen Cannon)	1
Marin	CDPH Volunteers (Brent Anderson, Cal Strobel)	5
	Drakes Bay Oyster Company	8
San Francisco	CDPH Volunteer (E. McNaughton)	3
	San Francisco Health Department	3
San Mateo	CDPH Volunteer (Kathleen Abadie)	3
	San Mateo County Environmental Health Dept.	3
	The Marine Mammal Center (Stan Jensen)	4
	U.C. Santa Cruz	2
Santa Cruz	Santa Cruz County Environmental Health Dept.	4
	U.C. Santa Cruz	5
	The Marine Mammal Center (Nancy Scarborough)	1
	Monterey Abalone Company	2
Monterey	CDPH Volunteer (Jerry Norton)	1
	San Luis Obispo	1
San Luis Obispo	Cal Poly	12
	Monterey Bay National Marine Sanctuary	4
	Morro Bay National Estuary Program	1
	Tenera Environmental	2
	The Marine Mammal Center (Tim Lytsell, P.J. Webb)	6
	Tomales Bay Oyster Company	4
	Santa Barbara	3
Santa Barbara	CDPH Volunteer (Sylvia Short)	3
	Channel Islands National Marine Sanctuary	4
	Santa Barbara Mariculture Company	7
	U.C. Santa Barbara	5
	National Park Service	1
	Vandenberg AFB	1
Ventura	CDPH Volunteer (Fred Burgess)	2
	Channel Islands National Marine Sanctuary	2
	Ventura County Environmental Health Department	1
Los Angeles	Catalina Island Marine Institute	2
	Los Angeles County Sanitation District	3
	City of Los Angeles Environmental Monitoring Div.	2
	Southern California Marine Institute	1
	Guided Discoveries, Tole Mour	5
Orange	Orange County Health Care Agency	1
San Diego	Carlsbad Aquafarms, Inc.	3
	Scripps Institute of Oceanography	4

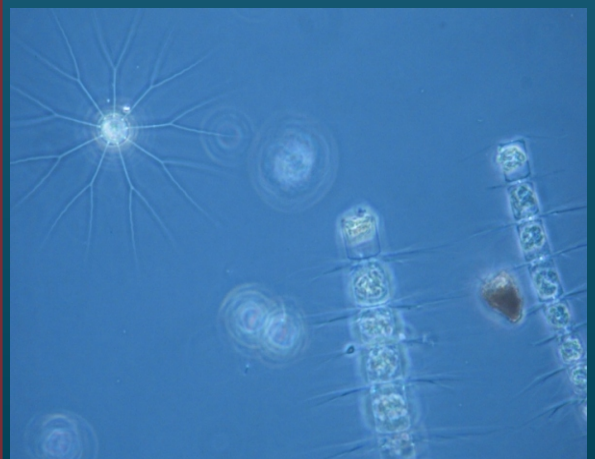
PHYTOPLANKTON GALLERY



Centric diatoms were common at several sites in northern California.



Pseudo-nitzschia declined in some areas, but remained common to abundant between Santa Cruz and San Luis Obispo counties.



Bacteriastrum was abundant in southern California. Note the cell "on end" in the upper left corner.